

A User-Oriented Approach to Building a Video Community in a Distributed Workplace

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ABSTRACT

In this paper we present experiences from a two-month pre-study on the possible creation of a communication environment (Media Space) between the three different locales of a distributed Call Centre. A spectrum of user-oriented methods was used in the study, and the staff at the Call Centre took part through interviews, discussions, and a workshop. The approach yielded useful information, and the feedback from the user group was very positive. Some pitfalls and risks were identified, such as technology focus, and to come up with solutions rather than to reflect on needs. A useful foundation was laid for the continuation of the project, which includes continued co-operative design work and the establishment of a communication environments in the workplaces.

Keywords

Video-mediated communication, distributed workplace, community, media space, design process, participatory design, video routing, fibre-link network

INTRODUCTION

In this paper we present and discuss experiences from a user-oriented approach used in a pre-study, where the possibilities to create a communication environment based on video between three different locations of a distributed workplace were investigated. The main purpose of the environment is to support co-ordination of activities, co-operation, and the sense of unity and common culture. Can such a video community be established? The workplace in question is the Stockholm County Police Call Centre, located on three islands in the Stockholm Archipelago: Arholma, Sandhamn, and Ornö.

The Call Centre started in the autumn of 1999, and has been in full use from June 2001. The Call Centre is a common resource, which is organized and managed as a single unit. It has a total of approximately 40 employees.

The primary task is to handle telephone reports from the general public concerning committed crimes (except

ongoing crimes) as well as general questions. In October 2001 the Call Centre handled 11975 cases, i.e., 47% of all telephone reports to the Police in Stockholm. Although the workplace is distributed, the staff works together, sharing and following up on the same tasks, as well as creating a common work schedule. This requires extensive communication and co-ordination between the three sites. Currently co-ordination is accomplished mainly by telephone calls and e-mail. There is also a strong need for face-to-face meetings. However, the employees seldom meet, because of the large distances and problems with transportation. For example, an entire day is needed for a regular meeting in the city.

From an initial assessment, we decided that the pre-study should focus on the question of how to establish efficient and rich channels for informal communication between the three locations. Traditional, face-to-face meetings are too cumbersome to organise and could not be held with sufficient frequency. The channels currently used for communication (e-mail and phone) are not flexible and rich enough to give support for efficient co-ordination. Moreover, with the kind and organisation of work at hand, it is important that a sense of unity and wholeness, as opposed to uniqueness and separation, can be maintained between the three locales of work.

Is it possible to create connections to distant places so they are experienced as immediate and natural extensions of the local environment, as communicative surfaces to co-workers at distant places? The question is in line with the research tradition of Media Spaces [2], of video- and audio connections that enable for people to work and to be together at a distance. As Mackay points out [7] "Media Space" refers to a special way of embedding the technology in the social environment and can include a range of forms of communication. Technically, Media Space refers to a continually open video- and audio connection, a technology which, of course, can be used for a variety of purposes, such as formal videoconferences, distance education, or contact with the general public in a number of scenarios. However, the focus of this pre-study is on informal encounters and peripheral awareness rather than formal meetings. The aim was to answer two questions: Would it be feasible to establish such a media space between the three places? If so, what characteristics should it have?

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METHODS AND IMPLEMENTATION

The pre-study was performed in October-November 2001 as a collaboration between the Stockholm County Police, the Centre for User-Oriented IT-design (CID), and the Advanced Media Technology Laboratory (AMT), at the Royal Institute of Technology (KTH) in Stockholm, and Arbetstagarkonsult. AB, an independent consultant.

Multidisciplinarity

To establish a common media space between the three locales of the workplace would imply changes in the physical as well as the social aspects of the work environment. Thus, a multidisciplinary project team was created, including competencies from Architecture, Cinema Studies, Social Anthropology, Human-Computer Interaction, Industrial Design, and Media Technology. A representative from the Stockholm County Police also took part in the research group, as well as an independent consultant who had previously performed a survey concerning the work at the Call Centres.

A spectrum of user-oriented methods

Users, i.e., the staff at the three workplaces were involved in all stages of the pre-study. In order to avoid a technical focus, which too often has been the case with similar projects, a spectrum of user oriented methods was chosen that can be classified as contextual design [9] co-operative design [1] and participatory design [5].

As was pointed out earlier, establishing a media space would greatly affect the work situation. Thus, the staff had to be an active and equal participant in all stages of the design (participatory design). Equally, any design suggestion should take the whole context of use (work situation and -content) into account (contextual design), which can only be accomplished in co-operation with all the parties involved (co-operative design). This combination of methods (method triangulation) was a deliberate choice to ensure richness in the working material and a possibility to collect as many aspects as possible [4]. In practice, we chose to make workplace visits with presentations, discussions, and interviews (formal and informal), and to arrange a workshop. All activities were well-documented on paper, photos, and video.

Workplace visits and interviews

The three locations of the Call Centre were visited, one by one, by the project team in two rounds. At the first visit at each Call Centre, the aim and organisation of the pre-study was presented to the staff. The concept of establishing video- and audio connections between the three locations of the workplace to solve the problems of co-ordination and communication they experience was presented, as a general suggestion, without going into detail. Representatives of the research team answered questions and initiated a discussion about possible uses of a communication environment. At the first visit the research team also wanted to gain a general understanding of how the

localities are used today, and to document the physical environment. The discussions and interviews with members of the staff were also documented.

The team also visited other units in the Police organisation to get an overview of the communication flow and to determine whether these units would benefit from similar communication environments at some point, later in the project, or if they should use other means of communication.

Workshop

Because the outcome of the first visit showed that the staff, in general, were positive to the idea of a common media space, the next step was taken and a whole-day workshop at the KTH was arranged with representatives from the workplace. The main intention was to open up an arena for discussion where all opinions mattered and the presuppositions of the research team would not overly affect the outcome. How did the staff envision the integration into their work process and the possible integration of a media space into their physical environment? In order to make ideas more concrete, to increase involvement and to activate the participants with the help of blueprints, pen, paper and glue, the discussion was somewhat geared towards the physical environment.



Figure 1. Members of the Call Centre staff discussing during workshop at KTH.

One aim of the workshop was also to let the staff experience communication over three working prototypes of the technology, locally between different rooms at the KTH. The prototypes were based on the ideas behind VideoCafé [8], a project at CID for a number of years, and on a technique for creating eye contact in videoconferencing that has been developed at AMT [10]. It should be pointed out that fibre-link connections are used in the system, and that the technical quality consequently is

very high. This would also be the case for the actual media space, if it were to be installed.

All results were presented internally, discussed, and documented by the end of the workshop.

Renewed workplace visits

A second round of visits, more informal because all the people involved by now knew one another, followed up on the discussions from the first visit and on the results from the workshop. Another aim of this visit was to examine technical and architectural characteristics more in detail, and to discuss some alternative placements of a media space installation.

PRE-STUDY RESULTS

All of the instant reactions while exploring the prototype communication environment were positive. Spontaneous comments like: "fun, exciting, 'important to see the one you're talking to', 'creates a better connection to someone', 'now we can have a day-to-day contact'". But there were also hesitant considerations regarding monitoring ('lurking') and if it affects individuals relations to each other.

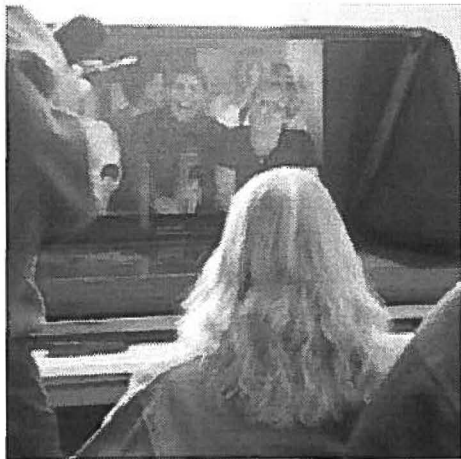


Figure 2. Members of the Call Centre staff using a prototype of the communication environment.

Functions and use scenarios

The staff came up with a whole range of possible areas of use for the media space:

- ? Informal meetings to increase co-operation.
- ? Experience-exchange.
- ? Company with others on remote site/s.
- ? Co-planning of work schedule.
- ? Decrease need for travel.
- ? Co-use of special competencies within the whole workgroup.
- ? Meetings for education, information, union meetings, etc.

Workplace effects

During the visits and the workshop, the project team discussed the physical environment with the staff. We arrived at a common understanding that whichever solution for integration of the communication environment would eventually be implemented, considerable alterations and restructuring of the localities to both host the technology and support the extended functionality would be needed. The boundaries of the communication environment (audio and video) need to be supported in the physical layout. You should not be able to be out-of-frame and still see or eavesdrop.

The work activities on the sites are surrounded with a demand for secure handling that has affected both the construction of the localities and the information technology already in use. This new communication environment need to meet the same requirements. As an extension to this, there will be specific requirements regarding activities in the communication environment. For example, since it, by definition, will emit sounds in the conduct (via loudspeakers from remote site/s and mouth at home location), this consequence need to be addressed.

The day-to-day contact will strengthen relationships between participants. But will the relationships formed in the communication environment become second-rate, as compared to those in the physical environment? Will there be new groups forming? Will the relations between the staff and their peers be affected? Will the work group seem larger with the use of the communication environment?

The activities need to be integrated in the present work flow, and the work flow needs to change according to these new inherent possibilities. The staff has already pinpointed several situations, for example the co-use of special competencies and co-planning of the work schedule, and these need to be implemented.

Principles for implementation

These principles are based on the specific requirements expressed by the user group in the activities described above.

Communication platform: The environment will primarily support informal communication in a day-to-day working context, and just like any other natural communication, the channel should always be open. In its default state, the user will not need to handle any functionality.

Reciprocity: If a person at a specific location sees and hears others on a remote site, then she is herself heard and seen. If any outgoing signal is disconnected by the user, the equivalent incoming signal is also disconnected. This guarantees that the user situation is equal at all existing nodes in the network and that 'lurking' is impossible.

Default mode: The environment will have a primary state (or default mode) which is 'always open'. If any additional

modes are required, it should be obvious what mode you are in and how you get back to the default mode.

DISCUSSION & FUTURE WORK

As a whole, the information gained with the methods used in the pre-study was rich and useful, both within the frame of the pre-study and as a foundation for a possible future project. It seems that the main reasons for success is the participation of the staff from the Call Centre, i.e., the future users, but also contributions from the participating key persons from the Stockholm County Police.

From a methodological point of view we would like to emphasise a few points: Systematic, close work with the intended user group was not easy to accomplish because of how the workplaces were situated, and the variation in the working hours. Nevertheless, by the end of the period most of the staff had had the opportunity to participate, one way or another. The spectrum of methods and approaches used in this study, then, was an advantage. Not only were there many opportunities for people to express their views, there were also a number of different situations available for doing so. E.g., some individuals prefer to talk in small, informal groups, others are at their best in a more formal setting.

Pitfalls and risks

In a multidisciplinary project group it is important that all members share an understanding of aims and methods. During the project work some differences were noted. "User point of view" and "user participation" means different things and implies a different approach for somebody working within an organisation, or in the workers union, as compared to someone working with user centred system development. Such differences in approach were not fatal in this pre-study, but they imply a need to discuss at a greater depth how to establish a "common ground", [3], i.e., the same goal for the work and the same understanding of how it should be carried out.

A specific caution in the project was to avoid a focus on technology. However, this proved to be difficult. First, we had a certain kind of system in mind at the outset and the work staff was not totally free to come up with any idea about what would satisfy their communication needs. Thus, there was already an implicit focus on technology from the outset. Second, as a consequence of this, the curiosity of the Call Centre staff had to be met, and it was not easy to know where to draw the line and direct discussions away from technology. A related problem, that needs to be met in the future, was a tendency of members both in the project group and the user group to come up with solutions, rather than to focus on what the needs were.

Future work

Hence, by working together with the to-be users, a useful foundation has been laid for the continuation of the project, which includes implementation of a system along the lines

that emerged from the pre-study (see above). The feedback from the user group was positive concerning the multidisciplinary character of the project group and the methods used. The possibility to participate and influence the project was greatly appreciated and brought on a feeling of security and comfort.

We plan to continue the project in three phases. In phase 1, use scenarios will be developed further, in co-operation with the work staff. We will continue to focus on different uses for the communication environment and then gradually move towards practical implementation issues, i.e. functionality, technology, and the physical environment. The work will mainly be conducted as a series of workshops.

Phase 2 is a period of iterative installment in the workplace(s). Experimental versions will be set up as working prototypes, or equally good representations of the functionality, in the actual use situation. The principal method of study is participatory observation. The results will be used as a basis for successive refinements, and, eventually, determine how the communication environment is integrated into the workplace.

In phase 3, the environment is installed and in use. This will be an intense period of research with participatory observations and other kinds of observation studies. Interviews and questionnaires will also be used, as in all phases of the project.

If it, by the end of phase 3, turns out that the communication environment will not be permanent and that the effort must be abandoned, we also need to plan a debriefing period with the staff [6].

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